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Epitome

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(57) [Abstract]
[Objects of the Invention] A manufacture method of construction is made comparatively easy, and it is made not to produce printing.
[Elements of the Invention] the slot 15 for dynamic pressure generating formed in the bearing member of hydrodynamic bearing equipment, or the peripheral surface of body of revolution 2 -- printing -- he is trying to form by printing using the paste ingredient 7 which distributed the PTFE particle to polyamidoimide resin preferably

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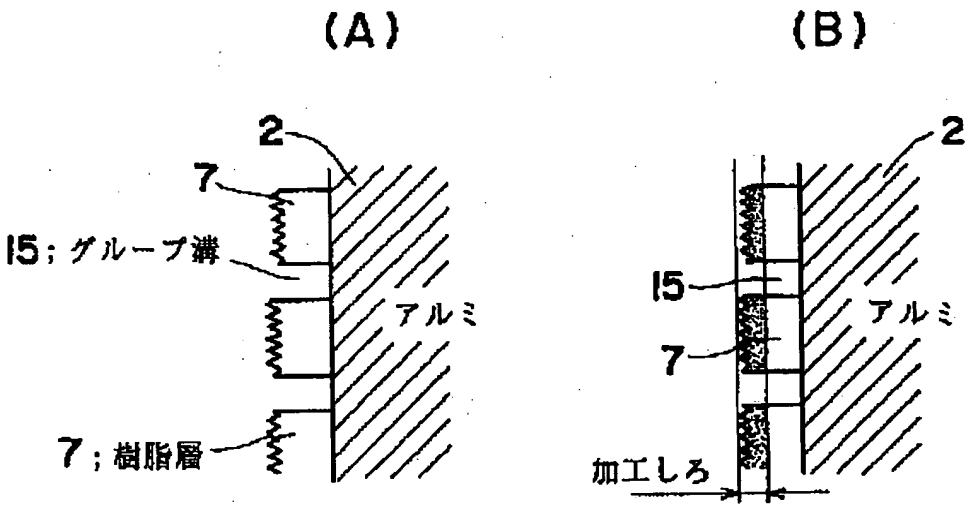

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CLAIMS

[Claim(s)]
[Claim 1] The hydrodynamic-bearing equipment characterized by to form said slot for dynamic-pressure generating in the peripheral surface of said bearing member or body of revolution by printing, and to grow into it in the hydrodynamic-bearing equipment which establishes spiral-like the slot for dynamic-pressure generating in either or the both sides of the bearing surface of body of revolution and the bearing member supported for it, enabling free rotation which does phase opposite, raises the hydrostatic pressure of a bearing clearance in an operation of said slot for dynamic-pressure generating at the time of rotation, and supports bearing load.
[Claim 2] Hydrodynamic bearing equipment according to claim 1 characterized by carrying out printing formation of said slot for dynamic pressure generating, and growing into polyamidoimide resin using the paste ingredient which distributed the PTFE particle.
[Claim 3] The processing approach of the hydrodynamic bearing equipment characterized by carrying out a cutting process by turning and obtaining a predetermined outer-diameter dimension after forming the slot for dynamic pressure generating between these resin layers and stiffening this resin layer, while printing a resin ingredient to the peripheral surface of a bearing member or body of revolution and covering with a resin layer.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]
[Industrial Application] This invention relates to the hydrodynamic bearing equipment which supports bearing load with the dynamic pressure of the fluid, for example, air, which at least fortune-telling makes a bearing clearance, an oil, a magnetic fluid, etc., etc. Furthermore, when it explains in full detail, this invention is used for supporting the shaft of Rota of the motor which rotates at the high speed of for example, the motor for a laser scan, a high-speed spindle motor, etc., and relates to the structure of the slot for dynamic pressure generating of suitable hydrodynamic bearing equipment.
[0002]
[Description of the Prior Art] In order to enable high-speed rotation, the dynamic pressure liquid bearing which supports the Rota (revolving shaft) section by the dynamic pressure fluid generated with rotation is adopted as the motor which rotates at a high speed like the motor for a laser scan, the motor for magnetic drums, a gyroscope motor, or a high-speed spindle motor. In order for this dynamic pressure liquid bearing to generate dynamic pressure, to float a revolving shaft and to support it at the time of rotation, between the revolving shaft and the bearing member, the very narrow fixed bearing clearance (usually several micrometers - about ten micrometers [Although it exaggerates by a diagram and is shown]) is formed. For this reason, if a precision is not made so that an unnecessary projection may not arise in the peripheral face (bearing surface) of a revolving shaft, and the inner skin (bearing surface) of a bearing member, a revolving shaft and a bearing member contact during rotation, frictional heat is generated, and there is risk of causing the so-called printing phenomenon in which a shaft and bearing agglutinate by melting of a contact part. This seizure phenomenon happens, although wear by contact in the low condition of the bearing load capacity at the time of deactivation generally serves as a trigger of printing, and also when contacting by vibration at the time of receiving external force etc. at the time of high-speed rotation.
[0003] On the other hand, while attaining lightweight-ization in high-speed rotation motors, such as a motor for a laser scan by which the hydrodynamic bearing is used abundantly, and shortening build up time, arranging the magnet for a drive, a coil, and an iron core inside the revolving shaft which constitutes a hydrodynamic bearing, and making small miniaturization of a motor, the deflection of a revolving shaft, and an inclination as much as possible is called for. Since in the case of such a hydrodynamic bearing of structure the configuration and structure of a revolving shaft become complicated and it is [carrying out the cutting process by turning of the aluminum containing alloy far / direction / in respect of processing cost] advantageous, to create the both sides of a revolving shaft and a bearing member with aluminum etc. is desired. And in order to raise the abrasion resistance of aluminum etc., nickel-P electroless deposition which includes hard-anodic-oxidation-coatings processing in a bearing member, and includes a SiC particle in Rota is performed conventionally.
[0004] Moreover, the slot with a depth [for dynamic pressure

generating] of several micrometers called a groove is established in the hydrodynamic bearing. For example, in establishing the slot for dynamic pressure generating in the Rota side, after making a predetermined value conventionally to the outer-diameter dimension of Rota made from aluminum by ball-race processing, it is made to correspond to the configuration of the slot for dynamic pressure generating, and etching resist is formed, and it etches and forms the slot for dynamic pressure generating. And he is trying to form a nickel-P-SiC plating coat on the surface of Rota.

[0005] On the other hand, in order to shorten the build up time of a motor, the hydrodynamic bearing equipment in which sliding nature formed the thrust-bearing side and radial bearing side of a rotation member with good and wear-resistant good synthetic resin is proposed by JP,4-78313,A. And fabricating the slot for dynamic pressure generating with this hydrodynamic bearing equipment in one to the bearing surface which dents a part of resin layer which covers the whole surface of the peripheral surface of Rota or a bearing member using injection-molding metal mold or a ball rolling technique, and consists of synthetic resin is proposed.

[0006]

[Problem(s) to be Solved by the Invention] however , since it be the plating liquid which distributed so much SiC for which they can say a degree of hardness also with an impurity in a plating reaction very much although both ingredients be highly excellent in abrasion resistance and a projection occur in a coat that it be easy to cause a reaction unevenness when perform hard anodic oxidation coatings processing and nickel-P electroless deposition containing a SiC particle , contact of Rota by the impact and the posture change under high rotation of Rota and bearing have the problem which cause in baking . Moreover, there are also very many routing counters for forming the slot for dynamic pressure generating, and it is highly precise, and since etching and plating are performed to Rota or the bearing member by which ball-race finishing was carried out, the precision and production control tend to become it is difficult and poor.

[0007] Moreover, in the case of JP,4-78313,A, in order to be based on the fabrication using injection-molding metal mold or ball rolling, it has the fault which cannot take out dimensional accuracy of the slot for dynamic pressure generating easily.

[0008] A manufacture method of construction is comparatively easy, and this invention aims at offering the hydrodynamic bearing which does not produce printing.

[0009]

[Means for Solving the Problem] In order to attain this purpose, this invention establishes spiral-like the slot for dynamic-pressure generating in either or the both sides of the bearing surface of body of revolution and the bearing member supported for it, enabling free rotation which does phase opposite, and he is trying to form the slot for dynamic-pressure generating in the peripheral surface of a bearing member or body of revolution by printing in the hydrodynamic-bearing equipment which raises the hydrostatic pressure of a bearing clearance in an operation of the slot for dynamic pressure generating at the

time of rotation, and supports bearing load.
[0010] Moreover, the hydrodynamic bearing equipment of this invention is made to carry out printing formation of the slot for dynamic pressure generating using the paste ingredient which distributed the PTFE particle to polyamidoimide resin.
[0011] Furthermore, after the processing approach of the hydrodynamic bearing equipment of this invention forms the slot for dynamic pressure generating between these resin layers and stiffens this resin layer while it prints a resin ingredient to the peripheral surface of a bearing member or body of revolution and covers it with a resin layer, he carries out the cutting process by turning of it, and is trying to obtain a predetermined outer-diameter dimension.
[0012]
[Function] Therefore, the slot for dynamic pressure generating is formed in the resin layer printed by the peripheral surface of Rota or a bearing member. For example, a resin layer is printed in the part except the part corresponding to the slot for dynamic pressure generating, and the part in which the resin layer between a resin layer and a resin layer does not exist is formed as a slot for dynamic pressure generating. After hardening a resin layer, a part for a machining allowance is removed by the cutting process by turning, and it is made a predetermined outer-diameter dimension. And the slot for dynamic pressure generating of the predetermined depth is obtained by coincidence.
[0013] Moreover, since the part in contact with the other party is covered with the resin layer, sliding nature becomes good and baking of Rota or a bearing member is lost.
[0014]
[Example] Hereafter, it explains to a detail based on the example which shows the configuration of this invention to a drawing. In addition, this example applies the polygon mirror currently used for optical scanners, such as a laser beam printer and facsimile, to the motor which carries out high-speed rotation.
[0015] One example of the motor for a polygon mirror drive which included the hydrodynamic bearing of this invention in drawing 2 is shown. The body of revolution 2 of the shape of a cylinder to which this motor for a polygon mirror drive supports the polygon mirror 1 (Rota), The bearing member 5 of the shape of a cylinder which is made to carry out fitting of this body of revolution 2, and constitutes a dynamic pressure liquid bearing between these body of revolution 2, It mainly consists of magnets 10 for a drive which fix to the inner skin of the core 9 for a drive (coil) which is installed in the center of this bearing member 5, and constitutes a stator group, and body of revolution 2, and constitute the Rota group. The motor 3 is constituted by the coil 9 and the magnet 10. The magnets 11 and 12 which constitute the magnetic crust bearing which surfaces [the upper limit and body of revolution 2 of a between / the Rota group and stator groups (for example, an iron core) / 8] body of revolution 2 to shaft orientations, respectively are formed. Magnets 11 and 12 surface body of revolution 2 by the adsorption power, and they are supported so that the Rota group and a stator group may serve as non-contact in the thrust direction. Moreover, the rotated object of polygon mirror

1 grade is attached in body of revolution 2. The polygon mirror 1 attached in the upper part of body of revolution 2 is pressed by the balancer 13 through a disk spring 14, and is being fixed to body of revolution 2. Moreover, the polygon mirror 1 is covered with the covering 6 constituted by flange 6a of the bearing member 5, and top-cover 6b fixed to this.

[0016] As shown in drawing 4, the slot 15 for dynamic pressure generating of the shape of a spiral for dynamic pressure generating is formed in the peripheral face of body of revolution 2 in a depth of 5 micrometers - 20 micrometers of ball-race processing of printing and after that. This slot 15 for dynamic pressure generating is formed by the resin layer 7, for example, the polyamidoimide resin layer which distributed the PTFE particle.

[0017] Here, body of revolution 2 and the cylinder-like bearing member 1 consist of aluminum (an aluminium alloy is included). And the alumite layer is formed in the inner skin of the bearing member 1, i.e., bearing surface 1a. Moreover, the resin layer 7 is covered by the peripheral face of body of revolution 2, and the slot 15 for dynamic pressure generating is formed. Formation of this slot 15 for dynamic pressure generating is performed as follows.

[0018] First, rough finishing which processes the peripheral face of body of revolution 2 into most outer-diameter dimensions by ball-race processing (lathe turning) is performed. Subsequently, in order to raise the adhesion reinforcement of an ingredient, nothing ground processing is chemically performed to the peripheral face of body of revolution 2. Then, polyamidoimide resin is used as the base and the paste ingredient which distributed the PTFE particle is printed to the peripheral face of body of revolution 2 using a screen printer. At this time, the slot 15 for dynamic pressure generating of a desired pattern configuration is formed in the peripheral face of body of revolution 2 with a paste ingredient by forming the slot pattern of arbitration in the screen plate. The slot 15 for dynamic pressure generating is formed between the layers of the paste ingredient of the front face of body of revolution 2, as shown in (A) of drawing 1 . After the completion of printing, since a paste ingredient is stiffened as shown in (B) of drawing 1 , finishing, the slot 15 for dynamic pressure generating of the predetermined depth, and the body of revolution 2 of a predetermined outer-diameter dimension are formed for those front faces by ball-race processing.

[0019] In addition, although an above-mentioned example is an example of suitable operation of this invention, in the range which is not limited to this and does not deviate from the summary of this invention, deformation implementation is variously possible for it. For example, although he is trying to apply the resin layer 7 to the front face of body of revolution 2 by screen-stencil, it is not limited to especially this, but you may make it print by other printing technique, such as offset printing, and may make it print to the inner skin side of the bearing member 5 in this example. Furthermore, the resin to print is not limited to especially above-mentioned polyamidoimide resin, either, but may adopt the good resin of the other sliding nature of low coefficient of friction.

[0020]

[Effect of the Invention] Since the hydrodynamic bearing equipment of this invention forms the slot for dynamic pressure generating in the peripheral surface of a bearing member or body of revolution by printing, it can process the slot for dynamic pressure generating easily, so that more clearly than the above explanation. And since the front face of Rota or a bearing member is covered with the resin layer which functions as lubricant, sliding nature becomes good, and baking is lost, even if it is shocked or posture change breaks out during rotation.
[0021] Moreover, in invention of claim 2, better sliding nature is obtained by the PTFE particle distributed by polyamidoimide resin.
[0022] Moreover, since in invention of claim 3 final finish-machining is performed after forming a resin layer by printing, the tolerance of the dimensional accuracy in the lathe-turning process of a last process, i.e., body of revolution, thru/or a bearing member can acquire breadth and the stable quality. Therefore, according to this invention, it is burned in the comparatively easy range, and control of a bearing clearance can aim at improvement in a load, and stopped being burned easily.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] In (A), in the explanatory view showing the structure and an example of a process of the slot for important section slack dynamic pressure generating of the hydrodynamic bearing equipment of this invention, (B) shows the condition of having finished the slot for dynamic pressure generating for the condition of having formed the resin layer by printing, by lathe turning of a resin layer.
[Drawing 2] The cross section of the right half of body of revolution is carried out, and central drawing of longitudinal section showing one example of the motor for polygon mirrors which applied the hydrodynamic bearing equipment of this invention shows it.
[Description of Notations]
1 Bearing Member

1a The bearing surface of a bearing member
2 Revolving Shaft
2a The bearing surface of a revolving shaft
7 Resin Layer
15 Slot for Dynamic Pressure Generating

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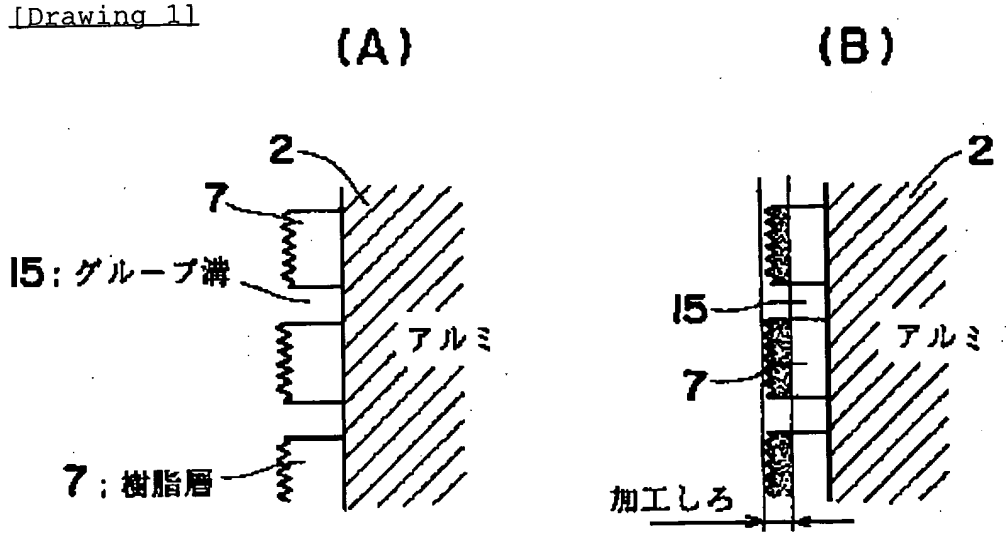
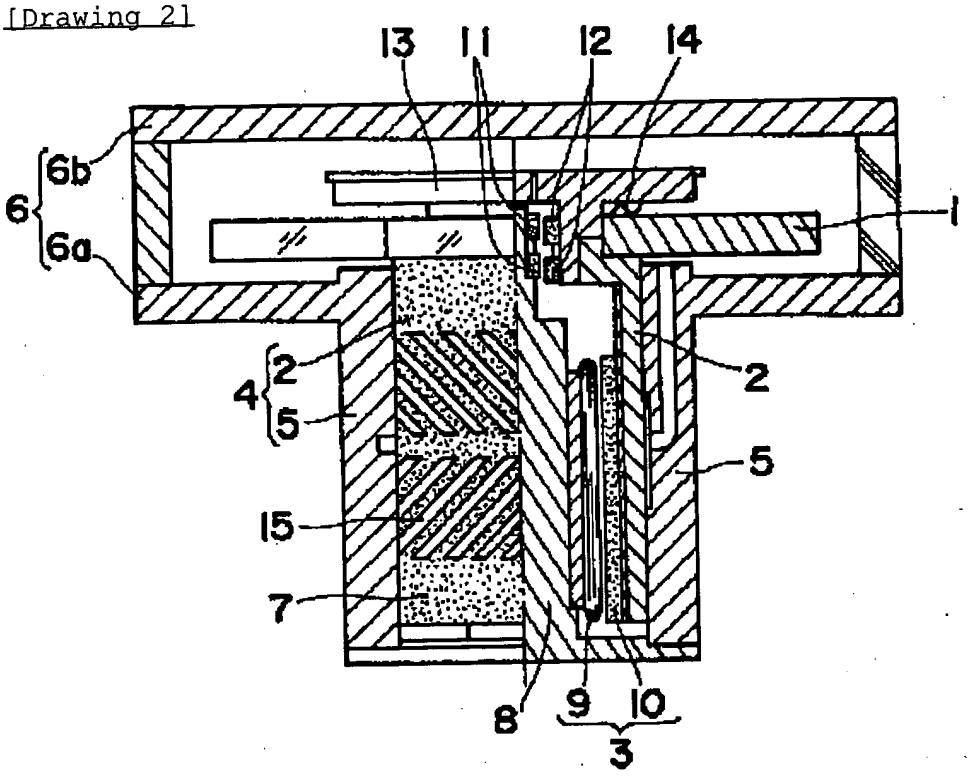
DRAWINGS

[Drawing 1]



[Drawing 2]



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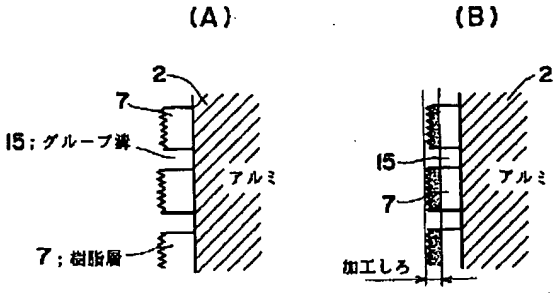
(54)【発明の名称】動圧軸受装置

(57)【要約】

【目的】　製作工法を比較的容易とし、かつ焼付を生じないようにする。

【構成】　動圧軸受装置の軸受部材または回転体２の周面に形成される動圧発生用溝１５を、印刷好ましくはポリアミドイミド樹脂にＰＴＦＥ微粒子を分散したペースト材料７を用いた印刷によって形成するようにしている。



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【特許請求の範囲】

【請求項１】　回転体とそれを回転自在に支持する軸受部材との相対向する軸受面のいずれか一方若しくは双方にスパイラル状の動圧発生用溝を設け、回転時に前記動圧発生用溝の作用で軸受隙間の流体圧を高めて軸受荷重を支承する動圧軸受装置において、前記軸受部材または回転体の周面に前記動圧発生用溝を印刷によって形成して成ることを特徴とする動圧軸受装置。

【請求項２】　ポリアミドイミド樹脂にＰＴＦＥ微粒子を分散したペースト材料を用いて前記動圧発生用溝を印刷形成して成ることを特徴とする請求項１記載の動圧軸受装置。

【請求項３】　軸受部材または回転体の周面に樹脂材料を印刷して樹脂層で被覆すると共に該樹脂層の間で動圧発生用溝を形成し、この樹脂層を硬化させた後に旋削加工して所定の外径寸法を得ることを特徴とする動圧軸受装置の加工方法。

【発明の詳細な説明】

【０００１】

【産業上の利用分野】本発明は、軸受隙間に占位する流体例えば空気や油、磁性流体などの動圧で軸受荷重を支承する動圧軸受装置に関する。更に詳述すると、本発明は、例えばレーザ走査用モータや高速スピンドルモータ等のような高速で回転するモータのロータなどの軸を支持するのに用いて好適な動圧軸受装置の動圧発生用溝の構造に関する。

【０００２】

【従来の技術】レーザ走査用モータ、磁気ドラム用モータ、ジャイロモータあるいは高速スピンドルモータのような高速で回転するモータ等には、高速回転を可能とするため、回転に伴って発生する動圧流体でロータ（回転軸）部を支持する動圧流体軸受が採用されている。この動圧流体軸受は、回転時に動圧を発生させて回転軸を浮揚させて支持するため、回転軸と軸受部材との間には極めて狭い一定の軸受隙間（図では誇張して示しているが通常、数μｍ～十数μｍ）が形成されている。このため、回転軸の外周面（軸受面）と軸受部材の内周面（軸受面）とに不要な凸起が生じないように精密に仕上げなければ回転中に回転軸と軸受部材とが接触して摩擦熱を発生し、接触部分の溶融により軸と軸受が凝着するいわゆる焼付現象を惹き起こす危険がある。この焼き付き現象は、一般には起動停止時の軸受負荷能力の低い状態での接触による摩耗が焼付の引き金となるが、また外力を受けた際の振動等によって高速回転時に接触する場合にも起こる。

【０００３】一方、動圧軸受が多用されているレーザー走査用モータなどの高速回転モータにおいては、軽量化を図って立ち上がり時間を短くすると共に、動圧軸受を構成する回転軸の内側に駆動用マグネットとコイル及び鉄心を配置してモータのコンパクト化と回転軸の振れや

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傾きを極力小さくすることが求められる。このような構造の動圧軸受の場合、回転軸の形状・構造が複雑になるためアルミ合金を旋削加工する方が加工コストの点で遥かに有利であることから、回転軸及び軸受部材の双方をアルミニウムなどで作成することが望まれている。そして、アルミニウムの耐摩耗性等を向上させるため、軸受部材には硬質アルマイト処理、ロータにはＳｉＣ微粒子を含むＮｉ－Ｐ無電解メッキが従来施されている。

【０００４】また、動圧軸受にはグルーブと呼ばれる動圧発生用の深さ数μｍの溝が設けられている。例えばロータ側に動圧発生用溝を設ける場合には、従来、レース加工によってアルミ製ロータの外径寸法を所定値に仕上げた後、動圧発生用溝の形状に対応させてエッチングレジストを形成し、エッチングを施して動圧発生用溝を形成する。そして、Ｎｉ－Ｐ－ＳｉＣメッキ皮膜をロータの表面に形成するようにしている。

【０００５】他方、特開平４－７８３１３号には、モータの立ち上がり時間を短縮するため、回転部材のスラスト軸受面とラジアル軸受面とを摺動性が良好でかつ耐摩耗性の良い合成樹脂で形成した動圧軸受装置が提案されている。そして、この動圧軸受装置では、射出成形金型やボール転造技術を利用してロータあるいは軸受部材の周面の全面を被覆する樹脂層の一部を凹ませて合成樹脂からなる軸受面に動圧発生用溝を一体的に成形することが提案されている。

【０００６】

【発明が解決しようとする課題】しかしながら、硬質アルマイト処理とＳｉＣ微粒子を含むＮｉ－Ｐ無電解メッキを施す場合、両材料とも非常に硬度が高く耐摩耗性には優れるものの、めっき反応においては不純物ともいえるＳｉＣを多量に分散させたメッキ液であるため反応むらを起こし易く皮膜に突起が発生することから、ロータの高回転中における衝撃や姿勢変化によるロータと軸受の接触が焼き付けを起こす問題を有している。また、動圧発生用溝を形成するための工程数も非常に多く、かつ高精度でレース仕上げされたロータあるいは軸受部材にエッチングとメッキが施されるため、その精度および工程管理が難しく不良となり易い。

【０００７】また、特開平４－７８３１３号の場合、射出成形金型やボール転造を利用した成形加工によるため動圧発生用溝の寸法精度を出し難い欠点を有している。

【０００８】本発明は、比較的製作工法が容易であり、かつ焼付を生じることのない動圧軸受を提供することを目的とする。

【０００９】

【課題を解決するための手段】かかる目的を達成するため、本発明は、回転体とそれを回転自在に支持する軸受部材との相対向する軸受面のいずれか若しくは双方にスパイラル状の動圧発生用溝を設け、回転時に動圧発生用溝の作用で軸受隙間の流体圧を高めて軸受荷重を支承す

る動圧軸受装置において、軸受部材または回転体の周面に動圧発生用溝を印刷によって形成するようにしている。

【００１０】また、本発明の動圧軸受装置は、ポリアミドイミド樹脂にＰＴＦＥ微粒子を分散したペースト材料を用いて動圧発生用溝を印刷形成するようにしている。

【００１１】更に、本発明の動圧軸受装置の加工方法は、軸受部材または回転体の周面に樹脂材料を印刷して樹脂層で被覆すると共に該樹脂層の間で動圧発生用溝を形成し、この樹脂層を硬化させた後に旋削加工して所定の外径寸法を得るようにしている。

【００１２】

【作用】したがって、ロータあるいは軸受部材の周面に印刷された樹脂層で動圧発生用溝が形成される。例えば、動圧発生用溝に対応する部分を除く箇所に樹脂層を印刷し、樹脂層と樹脂層との間の樹脂層が存在しない部分を動圧発生用溝として形成する。樹脂層は硬化した後に旋削加工によって加工代分が除かれて所定の外径寸法とされる。そして、同時に所定の深さの動圧発生用溝が得られる。

【００１３】また、ロータあるいは軸受部材は相手側と接触する部分が樹脂層によって被覆されているため、摺動性が良くなり焼き付けがなくなる。

【００１４】

【実施例】以下、本発明の構成を図面に示す実施例に基づいて詳細に説明する。尚、本実施例はレーザプリンタやファクシミリ等の光学走査装置に使用されているポリゴンミラーを高速回転させるモータに適用したものである。

【００１５】図２に本発明の動圧軸受を組込んだポリゴンミラー駆動用モータの一実施例を示す。このポリゴンミラー駆動用モータは、ポリゴンミラー１を支持する円筒状の回転体（ロータ）２と、この回転体２を嵌合させて該回転体２との間に動圧流体軸受を構成する円筒状の軸受部材５と、この軸受部材５の中央に設置されステータ組を構成する駆動用巻心（コイル）９及び回転体２の内周面に固着されロータ組を構成する駆動用マグネット１０とから主に構成される。コイル９とマグネット１０とによってモータ３が構成されている。ロータ組とステータ組との間、例えば鉄心８の上端と回転体２とに夫々回転体２を軸方向に浮上させる磁気クラスト軸受を構成するマグネット１１，１２が設けられている。マグネット１１，１２はその吸着力により回転体２を浮上させ、スラスト方向においてロータ組とステータ組とが非接触となるように支承している。また、回転体２にはポリゴンミラー１等の被回転物が取付けられる。回転体２の上部に取り付けられたポリゴンミラー１は皿ばね１４を介してバランサ１３によって押圧され、回転体２に固定されている。また、ポリゴンミラー１は軸受部材５のフランジ６ａとこれに固定される上蓋６ｂとによって構成されるカバー６で覆われている。

【００１６】回転体２の外周面には、図４に示すように、動圧発生のためのスパイラル状の動圧発生用溝１５が印刷とその後のレース加工によって５μｍ～２０μｍの深さで形成されている。この動圧発生用溝１５は樹脂層、例えばＰＴＦＥ微粒子を分散したポリアミドイミド樹脂層７によって形成されている。

【００１７】ここで、回転体２と円筒状の軸受部材１とはアルミニウム（アルミニウム合金を含む）で構成されている。そして、軸受部材１の内周面即ち軸受面１ａにはアルマイト層が形成されている。また、回転体２の外周面には樹脂層７が被覆されて動圧発生用溝１５が形成されている。この動圧発生用溝１５の形成は次のようにして行われる。

【００１８】まず、回転体２の外周面をレース加工（旋削）によって大体の外径寸法に加工する粗仕上げを行う。次いで、材料の密着強度を向上させるため回転体２の外周面に化学的になし地処理を施す。その後、ポリアミドイミド樹脂をベースとし、ＰＴＦＥ微粒子を分散したペースト材料をスクリーン印刷機を用いて回転体２の外周面に印刷する。このとき、スクリーン板に任意の溝パターンを形成しておくことによってペースト材料によって所望のパターン形状の動圧発生用溝１５が回転体２の外周面に形成される。動圧発生用溝１５は図１の（Ａ）に示すように回転体２の表面のペースト材料の層の間で形成される。印刷完了後、図１の（Ｂ）に示すようにペースト材料を硬化させてからそれらの表面をレース加工により仕上げ、所定の深さの動圧発生用溝１５と所定の外径寸法の回転体２を形成する。

【００１９】尚、上述の実施例は本発明の好適な実施の一例ではあるがこれに限定されるものではなく本発明の要旨を逸脱しない範囲において種々変形実施可能である。例えば、本実施例では樹脂層７を回転体２の表面にスクリーン印刷によって塗布するようにしているがこれに特に限定されず、オフセット印刷などの他の印刷手法によって印刷するようにしても良いし、また軸受部材５の内周面側に印刷するようにしても良い。更に、印刷する樹脂も上述のポリアミドイミド樹脂に特に限定されずその他の低摩擦係数の摺動性の良い樹脂を採用しても良い。

【００２０】

【発明の効果】以上の説明より明らかなように、本発明の動圧軸受装置は、動圧発生用溝を軸受部材または回転体の周面に印刷によって形成しているので、動圧発生用溝の加工が容易に行える。しかも、ロータあるいは軸受部材の表面が潤滑材として機能する樹脂層によって被覆されるので、摺動性が良好となり、回転中に衝撃を受けたり姿勢変化が起きても焼き付けがなくなる。

【００２１】また、請求項２の発明の場合、ポリアミドイミド樹脂に分散されたＰＴＦＥ微粒子によって、より

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良好な摺動性が得られる。

【００２２】また、請求項３の発明の場合、印刷によって樹脂層を形成した後に最終的な仕上げ加工を行うため、前工程即ち回転体ないし軸受部材の旋削工程での寸法精度の許容範囲が広がり、安定した品質を得ることができる。したがって、本発明によると、軸受隙間のコントロールが比較的容易な範囲で焼付き荷重の向上を図ることができ、焼付き難くなった。

【図面の簡単な説明】

【図１】本発明の動圧軸受装置の要部たる動圧発生用溝の構造とその製法の一例を示す説明図で、（Ａ）は樹脂層を印刷によって形成した状態を、（Ｂ）は樹脂層の旋

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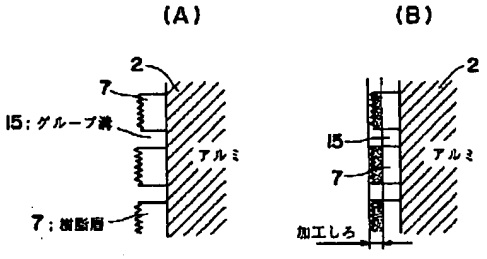
削によって動圧発生用溝を仕上げた状態を示す。

【図２】本発明の動圧軸受装置を適用したポリゴンミラー用モータの一実施例を示す中央縦断面図で回転体の右半分を断面して示す。

【符号の説明】

１　軸受部材
１ａ　軸受部材の軸受面
２　回転軸
２ａ　回転軸の軸受面
７　樹脂層
１５　動圧発生用溝

【図１】



【図２】